PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	**10/627,501**	Confirmation No.: 3242
Applicant(s):	**HEINZ ZOCH**	
Filed:	**July 25, 2003**	
TC/A.U.	**1713**	
Examiner:	**Wm. K. Cheung**	
Title:	**AQUEOUS, COLLOIDAL, FREEZE-RESISTANT AND STORAGE-STABLE GAS BLACK SUSPENSION**	

Docket No.: **032301.341**
Customer No.: **25461**

MAIL STOP AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

REQUEST FOR RECONSIDERATION
UNDER 37 C.F.R. § 1.116

Reconsideration is respectfully requested of the Final Office Action of October 13, 2006, relating to the above-identified application.

A request for a one month extension of time, together with the associated fee, is filed herewith.

Claims in the case are 1, 3 to 10 and 18 to 25.

Claims 1, 3 to 10 and 18 to 25 stand rejected under 35 U.S.C. § 103(a) in view of the reference of *Nagasawa, et al.*, U.S. 5,609,671 (*Nagasawa*). Applicants traverse the rejection and request reconsideration in view of the Declaration of Gerd Tauber filed herewith (the second Tauber Declaration).

Briefly summarized, the present invention relates to aqueous, colloidal, freeze-resistant and storage stable suspensions containing ~~a particular kind of carbon black which is known in~~ the industry as "gas black". The suspension contains 2 to 30% by weight gas black having a DBP number of 40-200 ml/100g. As an optional component, the suspension can also contain up

to 40% by weight of carbon black. In addition, a dispersion supporting additive, a biocide and water are present in the suspension composition. The gas black suspension is defined as having a zeta potential of less than -10mV, a surface tension of greater than 50mN/m and average particle size of less than 200nm, wherein the dispersion-supporting additive is a neutralized styrene-acrylic acid copolymer with an average molecular weight of 1000 to 20,000, having an acid value of 120-320 and which is present in the amount of 1 to 50 wt. %.

As explained in the application it is known that aqueous colloidal carbon black suspensions have been used for the production of lacquers and printing inks or directly as inks for example, in inkjet printers. Indeed, the cited *Nagasawa* patent shows water-based pigment inks containing carbon black having a surface active hydrogen content of not less than 1.5 mmol/g.

The gas black suspension of the present application is characterized by desired properties enabling its use in the preparation of lacquers and printing inks because of its good storage stability, freeze resistance, optical density and the like. Applicants submit the gas black of the present invention is distinctly different from the carbon black of *Nagasawa*.

Nagasawa discloses a carbon black dispersion being stabilized by a styrene methacrylic resin. The Final Action takes the position that the claimed "gas black" is a species of carbon black and that when *Nagasawa* discloses "carbon black", that term embraces applicants' gas black.

The Final Action also say that because there is only a "limited number of species of different kind of carbon black", one of ordinary skill in the art would not have difficulty in employing a gas black in place of the carbon black of *Nagasawa*.

The reasoning in the Final Action is faulty for the following reasons:

1. The test of obviousness is not whether it would or would not be difficult for the skilled worker to employ a gas black in place of another type of carbon black. Rather, Section 103 speaks to what would have been obvious from the prior art to one of ordinary skilled in the art at the time the invention was made. The reasoning in the Final Action erroneously presupposes a knowledge of applicants' gas black; that is, a gas black having the instantly defined characteristics and once it is known it would not be difficult knowing how to employ it. However, without the knowledge of applicants' gas black, the stable suspensions would not be known. Without the knowledge of applicants' gas black, it would not be known that successful dispersions would result therefrom.
2. The carbon black of *Nagasawa* is very particularly defined; namely, a carbon black having a surface action hydrogen content of not less than 1.5 mmol/g. *Nagasawa* shows that this feature is critical in achieving his results; see Table 1, col. 8 and co. 7, lines 60 to col. 8, line 28.

   Hence, one skilled in the art would <u>not</u> replace the carbon black of *Nagasawa* with another, different, carbon black that does not possess the stated property of active hydrogen content as defined by *Nagasawa*.

Filed herein is a second Declaration by one of the inventors, Mr. Gerd Tauber. Mr. Tauber's second Declaration is for the purpose of presenting additional evidence to determine the difference between applicants' gas black and *Nagasawa*'s carbon blacks when used in aqueous suspension. Mr. Tauber explains that his work was to compare the surface

active hydrogen content of *Nagasawa*'s carbon black with that of applicants' gas black. Thus, the experiments and laboratory work done by applicants is consistent with and addresses the issues raised in the Official Action; namely, that comparative data should be presented showing the criticality of the specific type of carbon black used herein; namely, the gas black and the neutralized styrene acrylic acid copolymer.

The active hydrogen content of applicants' carbon black and that of *Nagasawa* was measured by the XPS system, which has superseded the older Zerisel method used in *Nagasawa*'s work.

The side-by-side data clearly shows that applicants' gas black does not meet the criteria said by *Nagasawa* to be critical to obtain the desired results. Hence, applicants' gas black would not be obvious to use in place of that of *Nagasawa*.

Consequently, applicants respectfully submit that the data demonstrates that compositions containing the gas black as defined in the present invention achieved the intended criteria for producing an acceptable gas black suspension which could then be used to obtain good results in the printing tests as reported on page 10 of the application.

In view of the foregoing, applicants respectfully submit that the record has provided sufficient information to support the conclusion that the claimed subject matter brings about a result which could not have been predicted from the results shown in the cited reference. A person skilled in the art after reading the *Nagasawa* reference would not be led to make the necessary selections of the components as defined in the present claims with the expectation that a gas black suspension would result which would exhibit excellent results when subjected to the printing tests as described herein.

For reasons set forth above, it is respectfully submitted that the test data presented in this record rebut any *prima facie* obviousness of the claimed invention.

It is respectfully requested that the rejection of the claims be withdrawn and that the application be passed to issue.

Respectfully submitted,

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MAIL STOP AMENDMENT
Commissioner for Patents
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DECLARATION OF GERD TAUBER UNDER 37 CFR 1.132

Now comes Gerd Tauber and hereby declares and states:

I am one of the co-inventors of the above-identified U.S. Patent Application and have read and understood the above U.S. application and understand that the Examiner in the United States Patent Office has again rejected the claims in the above-identified application based on the U.S. Patent 5,609,671 of *Nagasawa*.

I understand in the Final Official Action the Examiner has said:

> "In view of limited number of species of different kind of carbon blacks, it would not be difficult for one of ordinary skill in art to employ a 'gas black' which is still a form of 'carbon black' in the disclosed composition of *Nagasawa, et al.*"

In addition to gas blacks, lamp black and furnace blacks, there are other varieties of carbon black such as thermal black, plasma black, channel black and acetylene black. Therefore, as a person skilled in this art, I would not consider the number of carbon blacks to be "limited".

To provide additional evidence of differences in properties between the gas black of this invention and the carbon black of *Nagasawa*, I call attention to the following:

In Claim 1 of patent U.S. 5,609,671, *Nagasawa* specifies a particular property of his carbon black; namely, the surface active hydrogen content of the carbon black is not less than 1.5 mmol/g. As disclosed in *Nagasawa*, the measurement for this surface active hydrogen content of carbon black is based on the Zeisel method; see col. 2, lines 31-32. The Zeisel method requires the treatment of carbon black with a diethyl ether solution of diazomethane. Diazomethane is classified as toxic with a high danger of corrosion to the eye and skin, and possibly carcinogenic to humans as well as explosive. This is described in the attached copy of a computer search containing product literature. Therefore, the Zeisel method is not used any longer by industry in general.

Modern test methods which are used as an alternative to the Zeisel method to determine surface active groups on pigment blacks are based on x-ray photoelectron spectrometry called XPS. This is described in the attached article "Carbon" 39 (2001) 1663-76, by the Pergamon Press.

Regarding the test results of *Nagasawa* listed in Table 1, col. 8, show that pigment blacks such as FW 200 and MA 100 do not meet the specification of not less than 1.5 mmol/g.

Listed below are the test results for surface active hydrogen content of FW 200 and MA 100 according to *Nagasawa* in comparison to XPS measurements.

Test Method	XPS Measurement	Zeisel Method According to *Nagasawa*
	C-OH app.	Claim 1: ≥ 1.5 mmol/g
	%	mmol/g
FW 200	appr. 3.10	appr. 1.20
MA 100	appr. 1.63	appr. 0.13
NIPex 160 IQ	appr. 0.95	

It becomes clear that XPS measurement of 3.1% for FW200 and 1.63% for MA 100 are both too low to meet the specification of *Nagasawa*. This confirms the data in Table 1 in respect of the values given for mmol/g.

In order to compare our gas blacks with the carbon blacks of *Nagasawa*, I have measured the active hydrogen content of our gas blacks using the XPS measurement system.

Our invention describes gas blacks which are represented by the gas black identified as NIPex 160 IQ. Measurement by XPS of NIPex 160 IQ results in a value of approximately 0.95 which confirms that the surface active hydrogen content of NIPex 160 IQ is much lower than FW 200 and MA 100 and, therefore, much lower than the carbon blacks of *Nagasawa*.

Based on my work as reported here, I have concluded that the gas black of the present invention represented by NIPex 160 IQ are very different from the carbon blacks of *Nagasawa*.

Details of my C.V. were provided in my earlier declaration.

I, Gerd Tauber, hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.

Date: January 18, 2007

Gerd Tauber